NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC) GUIDELINE SYNTHESIS

SCREENING FOR BREAST CANCER

Guidelines

1. U.S. Preventive Services Task Force (USPSTF). Screening for breast cancer: recommendations and rationale. Ann Intern Med 2002 Sep 3;137(5 Part 1):344-6. [10 references]
2. American College of Obstetricians and Gynecologists (ACOG). Breast cancer screening. Washington (DC): American College of Obstetricians and Gynecologists (ACOG); 2003 Apr. 12 p. (ACOG practice bulletin; no.42). [94 references]
3. American Cancer Society (ACS). ACS guidelines for breast cancer screening: update 2003. CA Cancer J Clin 2003 May-Jun;53(3):141-69. [184 references]
4. University of Michigan Health System (UMHS). Adult preventive health care: cancer screening. Ann Arbor (MI): University of Michigan Health System; 2004 May. 12 p. [4 references]

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INTRODUCTION

A direct comparison of USPSTF, ACOG, ACS, and UMHS recommendations for screening asymptomatic women for breast cancer is provided in the tables below (guidelines presented in chronological order). The guidelines differ somewhat in

scope, with some of the guidelines including recommendations beyond routine screening. For example, in addition to its screening recommendations, ACOG's guideline briefly addresses breast cancer risk assessment, the use of mammography for diagnostic purposes when a lesion is palpated, and referral for genetic counseling. The scope of the ACS guideline differs from the others in that it examines alternative screening modalities for women at increased risk and potential new imaging technologies for women at average risk of breast cancer. The ACS guideline also gives special focus to the screening of older women and women with comorbid conditions. In addition to breast cancer screening recommendations, UMHS also presents recommendations for cervical, colorectal, and prostate cancer screening.

Table 1 gives a broad overview of the scope of the guidelines included in this synthesis; Table 2 details each guideline's recommendations for mammographic screening as well as for other screening strategies; Table 3 specifies the potential benefits and harms associated with breast cancer screening as described in each of the guidelines.

The evidence supporting the major recommendations is also identified, with the definitions of the rating schemes used by USPSTF, ACOG, and UMHS included in Table 4.

Following the content comparison, areas of agreement and differences among the guidelines are discussed.

Listed below are common abbreviations used within the tables and discussions:

- ACOG, American College of Obstetricians and Gynecologists
- ACS, American Cancer Society
- BSE, breast self-examination
- CBE, clinical breast examination
- DCIS, Ductal carcinoma in situ
- UMHS, University of Michigan Health System
- USPSTF, United States Preventive Services Task Force

TABLE 1: SCOPE	
Objective	
USPSTF (2002)	• To update the 1996 recommendations on screening for breast cancer in women at average or high risk
ACOG (2003)	• To clarify the rationale for current breast cancer screening guidelines and evaluate the evidence regarding screening techniques • To focus on mammography and other detection techniques as screening tools to identify nonpalpable lesions

	• To aid practitioners in making decisions about appropriate obstetric and gynecologic care
ACS (2003)	• To review the existing ACS guidelines for the early detection of breast cancer based on evidence that has accumulated since the last revision in 1997
UMHS (2004)	• To implement an evidenced-based strategy for cancer screening in adults
Target Population	
USPSTF (2002)	• United States • Women aged 40 years and older
ACOG (2003)	• United States • Adult women
ACS (2003)	• United States • Women aged 40 years or older
UMHS (2004)	• United States • Adult women, 18 years and older
Intended Users	
USPSTF (2002)	Advanced Practice Nurses; Physicians; Nurses; Physician Assistants; Allied Health Care Practitioners; Students
ACOG (2003)	Physicians
ACS (2003)	Advanced Practice Nurses; Allied Health Personnel; Health Care Providers; Health Plans; Hospitals; Managed Care Organizations; Nurses; Patients; Physician Assistants; Physicians; Public Health Departments
UMHS (2004)	Physicians
Screening Interventions Considered	

USPSTF (2002)	• Routine screening with mammography alone or mammography and annual CBE • CBE alone • BSE
ACOG (2003)	• Mammography • CBE • BSE Note: Additional diagnostic procedures for the evaluation of a palpable breast mass (i.e., ultrasound, diagnostic mammography, and fine needle aspiration) and referral for management and genetic counseling are discussed in the guideline but are not addressed in this synthesis.

ACS (2003)	• Breast cancer screening in women of average risk
	  • Annual mammography beginning at age 40
	  • CBE
	  • BSE
	• Screening of older women with comorbid conditions
	• Screening of women at high risk
	
	Note: Additional screening modalities such as ultrasound and magnetic resonance imaging (MRI) were considered but evidence was insufficient for making a formal recommendation.

UMHS (2004)	• Mammography • CBE • BSE

TABLE 2: COMPARISON OF RECOMMENDATIONS FOR BREAST CANCER SCREENING	
Comparison Of Recommendations For Mammographic Screening	
USPSTF (2002)	• For women aged 40 and over, the U.S. Preventive Services Task Force recommends screening mammography, with or without clinical breast examination, every 1 to 2 years. (B recommendation). Clinical Considerations • The precise age at which the benefits from screening mammography justify the potential harms is a subjective judgment and should take into account patient preferences. Clinicians should inform women about the potential benefits

	(reduced chance of dying from breast cancer), potential harms (e.g., false-positive results, unnecessary biopsies), and limitations of the test that apply to women their age. Clinicians should tell women that the balance of benefits and potential harms of mammography improves with increasing age for women between the ages of 40 and 70. • Women who are at increased risk for breast cancer (e.g., those with a family history of breast cancer in a mother or sister, a previous breast biopsy revealing atypical hyperplasia, or first childbirth after age 30) are more likely to benefit from regular mammography than women at lower risk. The recommendation for women to begin routine screening in their 40s is strengthened by a family history of breast cancer having been diagnosed before menopause. • For women aged 50 and older, there is little evidence to suggest that annual mammography is more effective than mammography done every other year. • For women aged 40 to 49, available trials also have not reported a clear advantage of annual mammography over biennial mammography. Nevertheless, some experts recommend annual mammography based on the lower sensitivity of the test and on evidence that tumors grow more rapidly in this age group. • Older women (over age 69 years): The precise age at which to discontinue screening mammography is uncertain. Only two randomized controlled trials enrolled women older than 69, and no trials enrolled women older than 74. Older women face a higher probability of developing and dying from breast cancer but also have a greater chance of dying from other causes. Women with comorbid conditions that limit their life expectancy are unlikely to benefit from screening.
ACOG (2003)	• Women aged 40 to 49 years should have screening mammography every 1 to 2 years. (Level B) • Women aged 50 years and older should have annual screening mammography. (Level B) In light of available data, the optimal screening interval appears to be every 1 to 2 years for women aged 40 to 49 and annually thereafter. Current data do not clearly support a recommendation as to whether mammography annually or every 2 years is superior.
ACS (2003)	• Women age 40 to 69 years: Women at average risk should begin annual mammography at age 40. Women should have an opportunity to become informed about the benefits, limitations, and potential harms associated with regular screening. • Older women (over age 69): Screening decisions in older women should be individualized by considering the potential benefits and risks of mammography in the context of current health status and estimated life expectancy. As long as a woman is in reasonably good health and would be a candidate for

	treatment, she should continue to be screened with mammography. • High-risk women: Women at increased risk of breast cancer might benefit from additional screening strategies beyond those offered to women of average risk, such as earlier initiation of screening, shorter screening intervals, or the addition of screening modalities other than mammography and physical examination, such as ultrasound or magnetic resonance imaging. However, the evidence currently available is insufficient to justify recommendations for any of these screening approaches.
UMHS (2004)	• Average risk. Recommend screening mammography for women age 40 and older. Evidence for mortality reduction is strongest for women aged 50 and older [A]. Evidence is weaker and absolute benefit of mammography is smaller for women age 40 to 49. • High risk. Women at increased risk of breast cancer (see Table 1 in the original guideline document) may benefit from earlier screening and discussion of risk reduction strategies [D]. • Frequency. Little evidence is available regarding frequency of screening. Most experts recommend mammography either annually or every 1 to 2 years [D]. • Terminate. Consider screening depending on life expectancy (even for women over 69) [D].
Comparison Of Recommendations Regarding Clinical Breast Examination And Breast Self-Examination	
USPSTF (2002)	• The evidence is insufficient to recommend for or against routine CBE alone to screen for breast cancer. (I recommendation) • The evidence is insufficient to recommend for or against teaching or performing routine BSE. (I recommendation.) • Clinicians who advise women to perform BSE or who perform routine CBE to screen for breast cancer should understand that there is currently insufficient evidence to determine whether these practices affect breast cancer mortality and that they are likely to increase the incidence of clinical assessments and biopsies.
ACOG (2003)	• All women should have CBE annually as part of the physical examination. (Level C) Studies of efficacy have looked only at annual CBE; no studies have addressed other intervals. Therefore, there are no data on which to base a recommendation on the frequency of CBE. However, it seems prudent to perform CBE annually, perhaps with the annual physical examination. • Despite a lack of definitive data for or against BSE, BSE has the

	potential to detect palpable breast cancer and can be recommended.
ACS (2003)	• For average-risk asymptomatic women in their 20s and 30s, it is recommended that CBE be part of a periodic health examination, preferably at least every three years. Asymptomatic women aged 40 and over should continue to receive a clinical breast examination as part of a periodic health examination, preferably annually. • Beginning in their 20s, women should be told about the benefits and limitations of BSE. The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.
UMHS (2004)	• Evidence is insufficient to recommend for or against CBE and BSE. CBE. There is insufficient evidence to recommend for or against CBE. Clinical breast examination may augment mammography, but cannot be used alone as a screening tool. BSE. There is no randomized controlled trial in American women on the efficacy of breast self-examination (BSE). A large Chinese and a Russian randomized controlled trial on BSE revealed no decrease in mortality from breast cancer and a lack of stage shift. A substantial increase in the number of benign breast lesions were detected in women randomized to BSE.

TABLE 3: BENEFITS/HARMS OF BREAST CANCER SCREENING	
Potential Benefits Associated With Breast Cancer Screening	
USPSTF (2002)	• The USPSTF found fair evidence that mammography screening every 12 to 33 months significantly reduces mortality from breast cancer. Evidence is strongest for women aged 50 to 69, the age group generally included in screening trials. For women aged 40 to 49, the evidence that screening mammography reduces mortality from breast cancer is weaker and the absolute benefit of mammography is smaller than it is for older women. Most, but not all, studies indicate a mortality benefit for women undergoing mammography at ages 40 to 49, but the delay in observed benefit in women younger than 50 makes it difficult to determine the incremental benefit of beginning screening at age 40 rather than

	at age 50. The absolute benefit is smaller because the incidence of breast cancer is lower among women in their 40s than it is among older women. • The USPSTF concluded that the evidence is also generalizable to women aged 70 and older (who face a higher absolute risk of breast cancer) if their life expectancy is not compromised by comorbid disease. The absolute probability of benefits of regular mammography increases along a continuum with age, whereas the likelihood of harms from screening (false-positive results and unnecessary anxiety, biopsies, and cost) diminishes from ages 40 to 70. • The balance of benefits and potential harms, therefore, grows more favorable as women age. The precise age at which the potential benefits of mammography justify the possible harms is a subjective choice.
ACOG (2003)	Appropriate breast cancer screening using mammography and other screening techniques
ACS (2003)	• Decreased breast cancer morbidity and mortality due to early detection. • A meta-analysis of seven randomized controlled trials (RCTs) showed a 24% mortality reduction associated with an invitation to screening. • Evidence from service screening (i.e., screening in the community setting) demonstrates that modern, organized screening programs with high rates of attendance can achieve breast cancer mortality reductions equal to or greater than those observed in RCTs. Evaluation of service screening is an important new development because it measures the value of modern mammography in the community and it measures the benefit of mammography screening to women who actually get screened.
UMHS (2004)	Early detection and treatment may avert future cancer-related illness. From prospective randomized clinical trials, the evidence for screening is strongest in women age 50 to 69 with a relative risk of 0.76 in breast cancer mortality after 10 or more years of regular screening. Regular screening of 10,000 50 year-old women for 10 years saves about 37 lives. Based on the incidence rates and effectiveness of screening, screening 10,000 40 year-old women every year for 10 years, results in about 4 lives being saved. However, women in their 40s have more years of life saved than older women.
Potential Harms Associated With Breast Cancer Screening	
USPSTF (2002)	False positives. Similar to other cancer screening tests, the large majority (80 to 90%) of abnormal screening mammograms or CBEs

	are false-positives. These may require follow-up testing or invasive procedures such as breast biopsy to resolve the diagnosis and can result in anxiety, inconvenience, discomfort, and additional medical expenses. The consequences of false-positive mammograms are uncertain. Most, but not all, studies report increased anxiety from an abnormal mammogram. At the same time, some studies report that women in the United States may be willing to accept a relatively high number of false-positive results in the population in return for the benefits of mammography. Studies do not indicate that false-positive results diminish adherence to subsequent screening. False negatives. False-negatives also occur with mammograms and CBE. Although false-negative results might provide false reassurance, the USPSTF found no data indicating these led to further delays in diagnosis. Over-diagnosis and treatment. Some experts view the over-diagnosis and treatment of ductal carcinoma in situ (DCIS) as a potential adverse consequence of mammography. Although the natural history of DCIS is variable, many women in the United States are treated aggressively with mastectomy or lumpectomy and radiation. Given the dramatic increase in the incidence of DCIS in the past two decades (750%) and autopsy series suggesting that there is a significant pool of DCIS among women who die of other causes, screening may be increasing the number of women undergoing treatment for lesions that might not pose a threat to their health. Radiation risks. A final potential concern about mammography is radiation-induced breast cancer, but there are few data to directly assess this risk. A 1997 review, using risk estimates provided by the Biological Effects of Ionizing Radiation report of the National Academy of Sciences, estimated that annual mammography of 100,000 women for 10 consecutive years beginning at age 40 would result in up to 8 radiation-induced breast cancer deaths.
ACOG (2003)	Mammography Initial concerns about the risk of radiation (e.g., induction of breast cancer by radiation) have largely been allayed by improvements in mammography technique, technology, and clinical experience. False-positive mammograms (i.e., those with perceived abnormalities requiring further evaluation to verify that the lesion is not cancer) are a continuing concern. False-positive screening mammograms require diagnostic mammography with supplementary views, ultrasonography, and even biopsy in 20 to 30% of cases in an attempt to reach an accurate diagnosis. BSE An analysis by the Canadian Task Force on Preventive Health Care

	revealed fair evidence that BSE had no benefit and good evidence that it was harmful. This group concluded that among women aged 40 to 69 years, routine teaching of BSE should be excluded from breast cancer screening. Increased physician visits and higher rates of benign breast biopsies were documented to be adverse effects of BSE. In addition, studies were cited that revealed patients experienced increased worry, anxiety, and depression associated with BSE.
ACS (2003)	Limitations and harms of breast cancer screening include false negatives, false positives, over-treatment, and radiation. False Negatives/False Positives False negatives can be attributed to inherent technological limitations of mammography, quality assurance failures, and human error; false positives also can be attributed to these factors as well as to heightened medical-legal concerns over the consequence of missed cancers. Further, in some instances, a patient's desire for definitive findings in the presence of a low-suspicion lesion also contributes to false positives. The consequences of these errors include missed cancers, with potentially worse prognosis, as well as anxiety and harms associated with interventions for benign or nonobligate precursor lesions. The evidence suggests that some women experience anxiety related to screening and a greater percentage experience anxiety related to false-positive results, but for most women psychological distress is short-lived and does not have lasting consequences on either stress levels or likelihood of subsequent screening. Overtreatment Since some ductal carcinoma in situ (DCIS) is not progressive, diagnostic evaluation and treatment of DCIS lesions that would not progress to invasive disease is a harm associated with screening, although the extent of harm is uncertain, as is how it might be avoided. Overtreatment of a progressive DCIS lesion that could be cured with less aggressive treatment also represents a harm, although it should not be attributed to screening. Radiation Several studies have provided evidence for an increased risk of breast cancer after therapeutic radiation exposure or multiple exposures to diagnostic radiation. Overall risk from single and cumulative diagnostic exposures is small, but risk increases with the amount of exposure and with younger age at exposure. Thus, it is theoretically possible that cumulative radiation exposure associated with screening mammography increases the risk of breast cancer. It has also been hypothesized that some women at increased inherited risk for breast

	cancer may also have increased radiation sensitivity, which could increase their risk for radiation-induced breast cancer. Women whose regular screening begins at an early age (e.g., age 30) may have a higher potential for radiation-induced cancers.
UMHS (2004)	False negatives. Younger women are more likely to have false negative results as the sensitivity of screening mammography is lower in pre-menopausal women who have dense, nodular breasts. As women age, breast tissue becomes more fatty and breast cancers are more easily detected by screening mammography. False positives. Younger women are also more likely to have false positive mammogram results. False positive results necessitate further evaluation and have been shown to increase anxiety. About 97% of women aged 40 to 49 who have abnormal mammograms do not have cancer, compared to 86% of women age 50 and older. Radiation-induced breast cancer. It is estimated that annual mammography of 100,000 women for 10 consecutive years beginning at age 40 would result in up to 8 radiation-induced breast cancer deaths.

TABLE 4: EVIDENCE AND RECOMMENDATION RATING SCHEMES	
USPSTF (2002)	USPSTF grades the quality of the overall evidence on a 3-point scale (good, fair, or poor). Good Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes. Fair Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies; generalizability to routine practice; or indirect nature of evidence on health outcomes. Poor Evidence is insufficient to assess the effects on health outcomes because of limited number of power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes. The USPSTF grades its recommendations according to one of five

	classifications (A, B, C, D, or I), reflecting the strength of evidence and magnitude of net benefit (benefits minus harms). A The USPSTF strongly recommends that clinicians routinely provide [the service] to eligible patients. (The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms.) B The USPSTF recommends that clinicians routinely provide [the service] to eligible patients. (The USPSTF found at least fair evidence that [the service] improves health outcomes and concludes that benefits outweigh harms.) C The USPSTF makes no recommendation for or against routine provision of [the service]. (The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms it too close to justify a general recommendation.) D The USPSTF recommends against routinely providing [the service] to asymptomatic patients. (The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits.) I The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. (Evidence that [the service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined.)
ACOG (2003)	Levels of Evidence: Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force. I Evidence obtained from at least one properly designed randomized controlled trial. II-1 Evidence obtained from well-designed controlled trials without randomization. II-2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group. II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could

	be regarded as this type of evidence. III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees. Grades of Recommendations: Level A - Recommendations are based on good and consistent scientific evidence. Level B - Recommendations are based primarily on consensus and expert opinion. Level C - Recommendations are based primarily on consensus and expert opinion.
UMHS (2004)	Levels of evidence reflect the best available literature in support of an intervention or test: A. Randomized controlled trials B. Controlled trials, no randomization C. Observational trials D. Opinion of expert panel

GUIDELINE CONTENT COMPARISON

The U.S. Preventive Services Task Force (USPSTF), the American College of Obstetricians and Gynecologists (ACOG), the American Cancer Society (ACS), and the University of Michigan Health System (UMHS) present recommendations for screening mammography for breast cancer based on evidence available at the time of each report and provide explicit reasoning behind their judgments. The guidelines also evaluate other screening interventions for breast cancer, such as teaching breast self-examination in the periodic health examination and clinical breast examination. ACOG also provides recommendations for the evaluation of palpable and nonpalpable masses and referral for management and genetic counseling. The ACS guideline, while primarily focused on breast cancer screening using traditional methods, also examines new screening technologies as well as issues pertinent to screening older women and high-risk women. UMHS addresses cancer screening in general, providing recommendations for breast as well as cervical, colorectal, and prostate cancer screening.

Areas of Agreement

Mammographic Screening for Women Aged 50 to 69 Years

All four guidelines agree that routine screening mammography is indicated in women aged 50 to 69. ACS endorses annual screening, while UMHS and USPSTF recommend either annual or biennial screening. ACOG recommends annual screening for all women aged 50 years and older.

Screening of Women with Selected Risk Factors for Breast Cancer

USPSTF, UMHS, and ACS generally agree that there is value in adjusting the screening recommendations for women with risk factors for breast cancer. USPSTF states that the recommendation for women to begin routine screening in their 40s is "strengthened by a family history of breast cancer having been diagnosed before menopause."

UMHS suggests that women at increased risk may benefit from earlier screening and discussion of risk strategies. Regarding frequency of testing, UMHS further adds that individuals with breast conditions or specific risk profiles may require adjustments to this screening interval although no definitive mammography screening interval has been determined.

While ACS recommends annual screening of all women beginning at age 40, it also states that high-risk women might benefit from additional screening strategies. These strategies could include initiation of screening at age 30 years or younger, shorter mammographic screening intervals (e.g., every six months), and the addition of magnetic resonance imaging or ultrasound screening. ACS cautions, however, that there is insufficient evidence to justify recommending these options in high-risk women, and it emphasizes the need for further clinical data on screening women at increased risk.

Although ACOG makes no formal recommendations for or against screening in high-risk populations, they do provide a brief discussion of factors that increase the relative risk for breast cancer in women, acknowledging that the incidence of breast cancer increases with age and that a personal history of breast cancer, either invasive or in situ, is a clinically meaningful risk factor. They further note however, that an Evidence Report commissioned by the Agency for Healthcare Research and Quality (AHRQ) (Diagnosis and management of specific breast abnormalities. Rockville [MD]: AHRQ. 2001. [Evidence Report/Technology Assessment; no. 33] AHRQ Publication No. 00-E046) recommends against modifying the workup on the basis of risk factors other than age. Additionally, ACOG refers to provisional recommendations from the Cancer Genetics Studies Consortium that recommends "education regarding monthly breast self examination, annual or semiannual clinical breast examination beginning at age 25 to 35 years, and annual mammography beginning at age 25 to 35 years" for women who carry the BRCA1 or BRCA2 mutation.

Mammographic Screening of Older Women ($\geq$70 years)

All four guidelines generally agree that there is no clear age at which mammographic screening should be discontinued. Rather, the decision to screen should be made on an individual basis, taking into account personal preferences and weighing individual risks and benefits.

Areas of Differences

Mammographic Screening of Women Aged 40 to 49 Years at Average Risk of Breast Cancer

The value of routine screening of women aged 40 to 49 years at average risk of breast cancer is an area of controversy among the guideline groups. Much of the controversy is due to the quality and interpretation of clinical trial data regarding mortality benefits of mammographic screening.

ACS recommends routine annual mammographic screening, while UMHS, USPSTF and ACOG recommend annual or biennial screening in this age group. The groups acknowledge that the evidence for absolute benefit from screening of women younger than 50 years is weaker than the evidence for older women; however, a mortality benefit for women aged 40 to 49 has still been shown in some clinical trials. USPSTF's most recent (2002) recommendation concerning routine mammographic screening for women younger than age 50 is a change from its 1996 guideline, which found insufficient evidence to recommend for or against screening in this age group. The USPSTF has reviewed seven randomized controlled trials (RCTs) enrolling women aged 40 to 49, six of which were at least of "fair" quality. One of the trials was designed to specifically address benefits of screening in this age group and reported no reduction in breast cancer mortality with annual mammography and clinical breast examination. Of the remaining five trials, one reported significant mortality reductions, three reported non-significant mortality reductions, and one found no benefit. A meta-analysis pooling the results for women aged 40 to 49 in these six trials showed that the relative risk for breast cancer mortality was 0.85 (95% confidence interval 0.73 to 0.99) among screened women after 13 years of observation. These results are similar to prior meta-analyses based on older data. On average, the time until mortality benefits began to be observed was longer in women under 50 years than in older women. The analysis suggests that at least some of the mortality reduction was due to early detection of tumors before age 50.

Citing the meta-analysis performed by USPSTF, UMHS likewise recommends screening mammography begin at 40 years of age, being performed annually or every 1 to 2 years.

Like USPSTF and UMHS, ACOG recommends annual or biennial screening in women aged 40 to 49 years, noting that current data do not clearly support a recommendation as to whether mammography annually or every 2 years is superior. ACOG notes that the variability of the design, technology, methodology, interpretation, and endpoints of most of the trials does not permit meaningful comparisons.

ACS cites updates in the evidence from a number of individual RCTs of breast cancer screening and meta-analyses of these data, including the current (2002) USPSTF meta-analysis to justify their recommendation for annual screening in women beginning at age 40 years. In addition, ACS presents evidence from service screening (i.e., screening in the community setting), which appears to show mortality reductions similar to those seen in randomized controlled trials.

Clinical Breast Examination (CBE)

There are some differences in the recommendations offered concerning CBE as a breast cancer screening measure. The differences stem chiefly from the lack of firm evidence that CBE alone reduces breast cancer mortality and from the perceived value of CBE in detecting palpable tumors.

USPSTF and UMHS state that there is insufficient evidence to recommend for or against routine CBE alone to screen for breast cancer. USPSTF cites evidence that reductions in breast cancer mortality in studies using mammography alone are comparable to those using mammography plus CBE. UMHS notes that only 4% of women with abnormal CBE are subsequently diagnosed with cancer. They further note that CBE may augment mammography, but cannot be used alone as a screening tool.

ACS on the other hand, recommends CBE in all women over age 20. Similarly, ACOG recommends clinical breast examination annually, perhaps with the annual physical examination, but provides no age ranges. ACS recommends that CBE be performed at least every three years for women in their 20's and 30's and annually beginning at age 40. ACS and ACOG both present a detailed discussion of available data. ACS concludes (based on weak and indirect evidence) that the contribution of CBE to breast cancer detection in asymptomatic women is small, especially in view of the high-quality mammography available today. They note, however, that when done prior to mammography, CBE may identify an area of suspicion and/or help guide subsequent imaging exams. They further note that as the proportion of women receiving regular mammograms increases, the relative contribution of CBE to early breast cancer detection and its cost-effectiveness warrant renewed attention. ACS still recommends periodic CBE, however, in part because the exam may provide the opportunity for clinicians to educate patients on breast cancer-related topics, including screening mammography. ACS also notes that its expert panel was divided in continuing to recommend periodic CBE, with some members believing that the evidence against the benefit of CBE was not strong enough to abandon the recommendation and others advocating elimination of the recommendation because is was not evidence-based.

ACOG cited a review in which pooled data for all controlled trials and case-control studies involving CBE demonstrated a sensitivity of 54% and a specificity of 94% for CBE screening. Although the evidence was indirect, the review supported the use and effectiveness of clinical breast examination. ACOG also cites multiple reviews that have supported the combination of clinical breast examination and mammography for breast cancer screening. ACOG acknowledges that studies of efficacy have looked only at annual clinical breast examination and at no other time intervals; therefore, ACOG recommends annual CBE screening.

Breast Self-examination (BSE)

Although all of the groups have reservations about the value of BSE, they differ somewhat in their final recommendations to patients and health care providers.

There is general agreement on the lack of a clear benefit for breast self-examination (BSE) as a screening measure for breast cancer. USPSTF concludes that there is insufficient evidence to recommend for or against teaching or performing BSE in any age group. USPSTF states that the accuracy of BSE is largely unknown, and that the available evidence shows a sensitivity of only 26 to

41% compared with clinical breast examination and mammography. UMHS acknowledges that there is no RCT in American women on the efficacy of breast self-examination, but does refer to other RCTs in China and Russia that revealed no decrease in mortality for breast cancer despite a substantial increase in the number of breast lesions detected.

Despite the fact that ACOG recognizes the lack of definitive data for or against BSE, the group states that BSE has the potential to detect palpable breast cancer and therefore recommends it.

Among all the guideline groups, ACS makes the strongest recommendation in favor of BSE, even though they acknowledge the absence of definitive randomized clinical trial data from which to draw conclusions. Their recommendation is derived from expert opinion, which in turn is based on population-based studies showing that many breast cancers are self-detected. Earlier detection of palpable masses, they reason, can lead to earlier treatment in average-risk women under age 40. ACS also emphasizes that BSE heightens awareness of women to normal breast tissue, which makes it more likely for them to detect changes from normal. Thus, ACS advocates BSE instruction for women beginning in their 20s, with the dual provisos that women be told of both its benefits and limitations, and that it is acceptable for women not to perform BSE. Women should be advised to report any new breast symptoms promptly to their health care provider. Finally, as with CBE, the ACS guideline panel was divided on whether to abandon the recommendation for BSE because of the lack of sufficient evidence.

This Guideline Synthesis was prepared by ECRI on December 28, 1998. It was reviewed and verified by the guideline developers as of February 19, 1999. This Synthesis was subsequently modified by ECRI in 2001, 2002, 2003, 2004, and 2005. The most current version of this Synthesis incorporates the 2004 UMHS recommendations. This synthesis was verified by UMHS on November 3, 2005. This Synthesis was updated by ECRI on August 8, 2006 and on December 14, 2006 following the withdrawal of the Kaiser Permanente Southern California guideline, and the Brigham and Women's and Canadian Task Force guidelines respectively from the NGC Web site.

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